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Imagery analysis report

**Typhoon SSBN Construction at
Severodvinsk Shipyard 402
USSR (TSR)**

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JANUARY 1970**

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TYPHOON SSBN CONSTRUCTION AT SEVERODVINSK SHIPYARD 402 USSR (TSR)

INTRODUCTION

1. (TSR) This report summarizes previously reported information of intelligence significance related to the production of a new series, nuclear-powered, ballistic missile submarine (SSBN) at Severodvinsk Shipyard 402, USSR [REDACTED]. Imagery data and individual items have been reported in various National Photographic Interpretation Center (NPIC) products. Because no intelligence community name has been given to this submarine, the Soviet designation Typhoon¹ will be used in this report. All usable KEYHOLE imagery related to the identification of components associated with the construction of the Typhoon SSBN was used in the preparation of this report. This report contains 38 illustrations (annotated photographs and conceptual drawings) which are presented chronologically and are keyed to the text.

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CHRONOLOGY

2. (TSR) Since 1970, the Soviets have been building a new construction complex in the vicinity of construction hall 1. The complex comprises a large construction hall (construction hall 3), a large fabrication building (fabrication building 2), and an expansion of the launch basin in front of construction hall 3. The main portion of construction hall 3 is 433 by 129 meters by 66 meters high and appeared to be externally complete in early 1975. Fabrication building 2 is 297 by 172 meters by 42 meters high and appeared to be externally complete by mid-1976. Expansion of the launch basin in front of construction hall 3 has been ongoing since early 1973. The major construction on the basin expansion was complete by late 1978; however, work on the launch rails from construction hall 3 and the ledges that will support the launch dock continued throughout 1979. Construction of a new fitting-out quay and the erection of two large jib cranes on the north side of the launch basin also continued throughout 1979.

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3. (TSR) The first indication of Typhoon SSBN construction was on [] when an unidentified pressure hull section was observed adjacent to construction hall 2. The hull section was crated in a boxlike structure, [] The hull section appeared to fill the boxed structure, which would mean a diameter of approximately [] which is approximately [] larger than any known SSBN pressure hull section.

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4. (TSR) A probable reactor compartment grid was observed on the temporary rail spur leading into the back of construction hall 3 on [] The divided areas in the grid match openings in the probable reactor foundation plate observed in the open storage area at the east quay. Neither of these components resembled reactor components identified for the Yankee/Delta (Y/D)-class construction programs, and the location of this reactor component suggests that it is intended for a vessel in the early stage of construction inside hall 3.

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5. (TSR) Two probable reactor foundation plates with compatible openings were observed next to the sandblasting building behind construction hall 1 between [] The movement of these two plates could indicate the early stage of construction of a second unit in construction hall 3, or they could possibly have been intended for the nuclear-powered guided missile submarine (SSGN) believed to be under construction in hall 1.

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6. (TSR) By [] an additional crated hull section had been positioned on the transverser behind construction hall 2. By [] a third hull section was observed on the rail line which serves the east end of construction hall 2. By [] one of the hull sections had disappeared, and by [] the remaining two were gone. The construction of the hull sections at hall 2 was probably an interim measure pending the completion of fabrication building 2 which now serves construction hall 3.

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7. (TSR) Between April and June 1975, the roadbed from construction hall 2 to construction hall 3 had been resurfaced and the turns reconfigured for large-radius turns. The resurfaced section of the road extended from the transverser at construction hall 2 directly into two of the large doors at the rear of construction hall 3.

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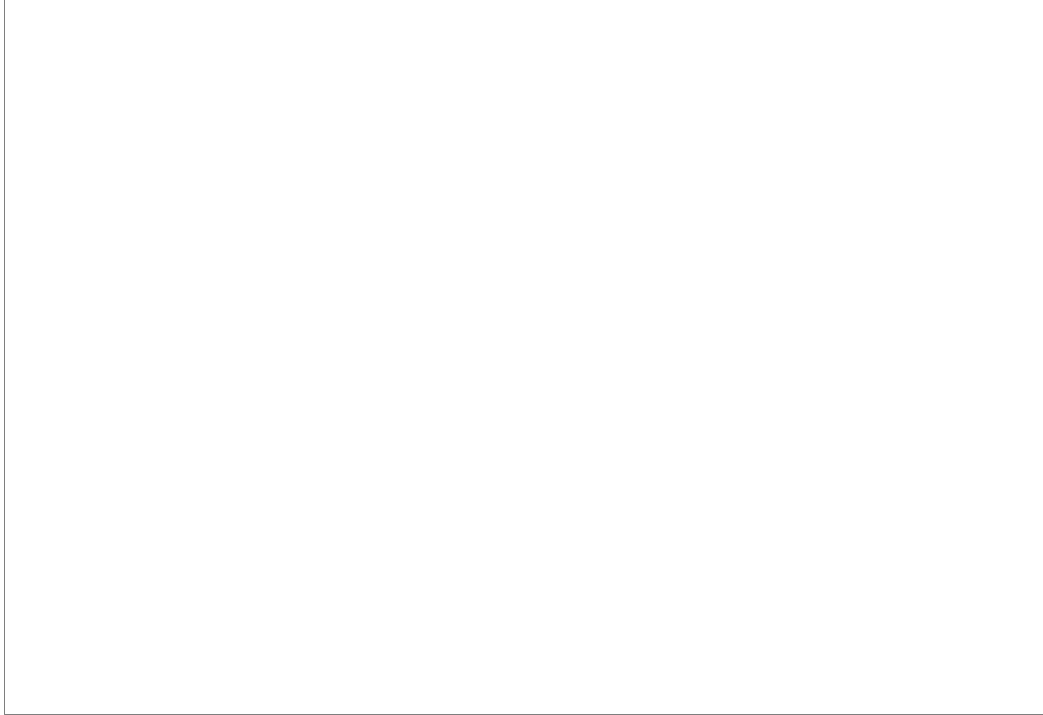
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8. (TSR) The large, rubber-tired hull section transporter was first identified on the transverser adjacent to construction hall 2 on [REDACTED] Although it was observed in actual use only once (in October 1977), the association of the hull section transporter with construction halls 2 and 3 and its travel on the resurfaced and reconfigured road between the halls on [REDACTED] indicated that it was used to transport the encased hull sections to construction hall 3. When not in actual use, the transporter has generally been parked in the position shown.

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9. (TSR) No additional components associated with the construction program in hall 3 were identified between July 1975 and September 1977. Since September 1977, however, evidence supporting the construction of a Typhoon-class SSBN has continued to accumulate. On [REDACTED] two internal missile bay deck plates were identified with circular cutouts whose diameter exceeded those for the internal missile bay deck plates in D-class submarines. One plate was [REDACTED] and had four circular cutouts. The second plate was [REDACTED] and had two circular cutouts. The cutouts were approximately [REDACTED] in diameter and [REDACTED] (meter) center-to-center on both plates.

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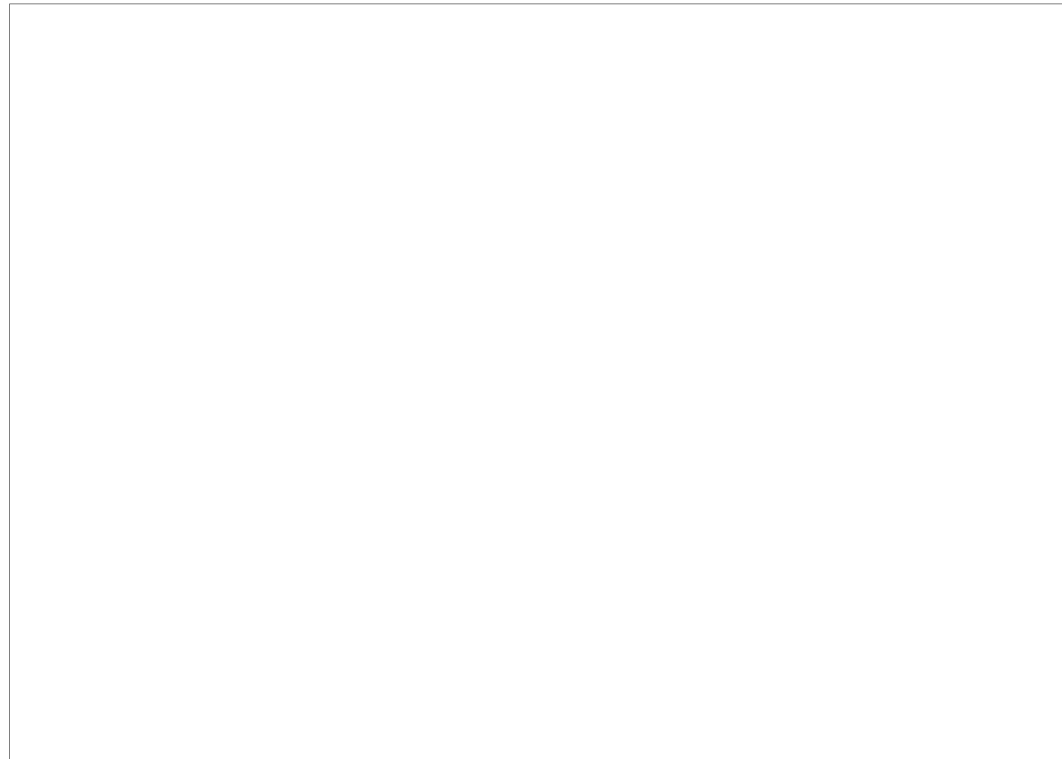
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10. (TSR) On [] the two internal missile bay deck plates were on the rail spur adjacent to the sandblasting building, and on [] both plates were on the rail spur leading into construction hall 3.

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11. (TSR) On [] flat plate with two circular cutouts, [] in diameter and [] (meter) center-to-center, was seen on a railcar in front of the fabrication buildings at the south end of the launch basin. The plate seen on [] is believed to be the same size as the two-hole plate seen on []. Circular cutouts in all the two-hole and four-hole plates seen from [] through [] are believed to be [] in diameter. Differences in measurements were probably the result of distortion and poor resolution on the []. The holes in these plates are appreciably larger than the [] in D-class SSBN missile bay deck plates and appear to be compatible with the [] outside dimensions of the launch tube doors on the popup test barge at Balaklava Submarine Base and Ship Repair Yard [] and the [] launch tube on the Golf (G)-V ballistic missile submarine (SSB) which is believed to be the test platform for the submarine-launched ballistic missile (SLBM) currently under development.

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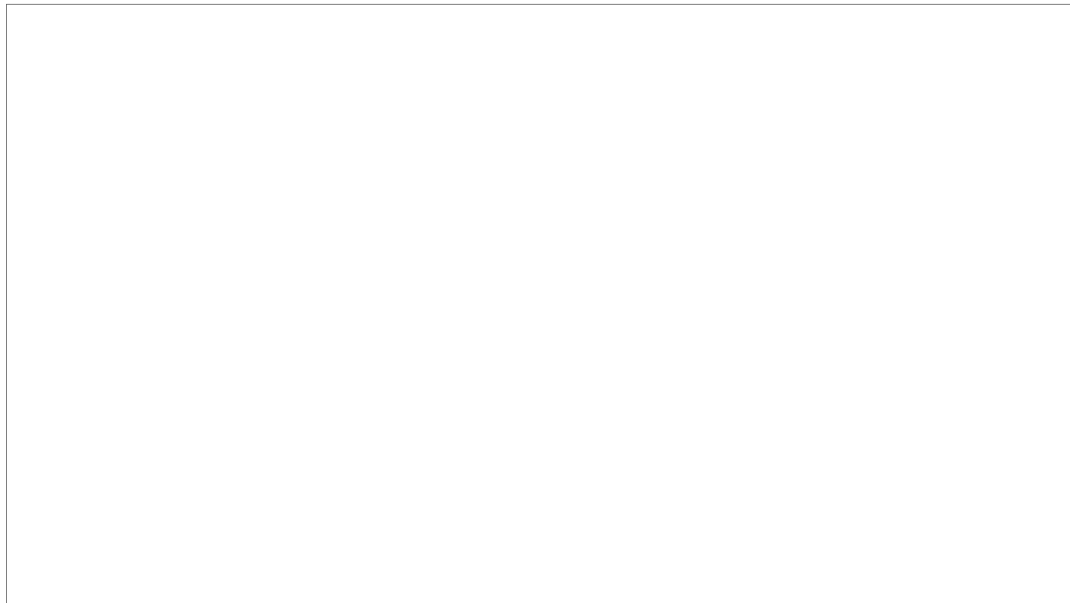
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12. (TSR) An additional probable internal missile bay deck plate with a single cutout in one corner was identified on [REDACTED] This plate was approximately [REDACTED] and the diameter of the cutout appears to be identical to the [REDACTED] cutouts in the nearby two-hole plate. A similar plate was observed in the staging area adjacent to fabrication building 1 on [REDACTED]

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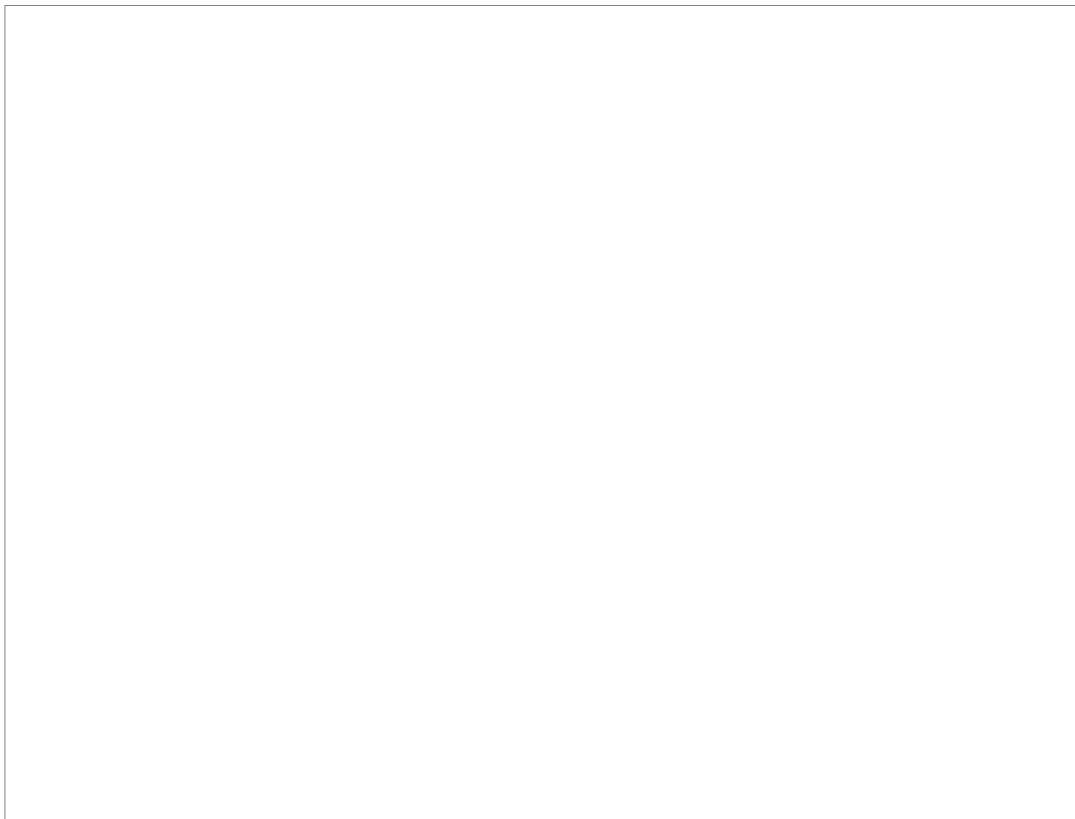
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13. (TSR) A probable missile tube door with a width of [REDACTED] and a length of [REDACTED] [REDACTED] was observed on [REDACTED] This probable door is considerably larger than the [REDACTED] door on the D-class SSBNs and is probably intended for the Typhoon SSBN.

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14. (TSR) A probable missile tube door of similar size was observed near construction hall 1 on 25X1
 This door was inverted and was A possible 25X1
hull penetration reinforcement plate was nearby. The purpose of this plate is unknown, and it may or may
not be related to SSBN development.

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15. (TSR) On a submarine pressure hull section with a diameter of at least 25X1
meters was observed on the wheeled hull section transporter in back of construction hall 2. Although the
diameter of this hull section does not preclude its being intended for a D-class SSBN, the length 25X1
is different from that of previously observed SSBN hull sections. When next observed on 25X1
the wheeled transporter was at its usual parking place at the rear of construction hall 3.

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16. (TSR) An unidentified component was observed on the rail spur leading into construction hall 3 on [REDACTED] The component was approximately 5 by 5 meters and sharply tapered at the trailing end. The relationship of this component to a current submarine construction program is unknown.

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17. (TSR) Probable SLBM launch tube covers have been observed at various locations throughout the Severodvinsk Shipyard since mid-1978. The covers are boxlike in shape and are approximately 16 by 4 meters. These covers are slightly larger than and are shaped differently from the covers used to conceal the SS-N-18 missile tubes and compare favorably to the approximately [REDACTED] launch tubes removed from the large SLBM popup barge (platform 8) at Balaklava in late September 1979.

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18. (TSR) On [] two possible SSBN missile bay internal-deck-level subassemblies were observed on railcars at the southeast entrance to pressure hull fabrication building 1. The subassemblies were [] Both subassemblies were positioned on their sides and cast shadows which were excellent for analysis of the circular cutouts for the missile tubes. The cutouts were [] in diameter and [] center-to-center. One subassembly had two complete cutouts; the other subassembly with one complete and one partial cutout probably will be joined to a similar subassembly to complete the partial cutout. Both subassemblies were two deck-levels high and are probably to be installed in the lower levels of the submarine, as only the upper deck on each subassembly contained circular cutouts. The cutouts in these subassemblies were similar in dimension and appearance to the flat plates seen on the rail spur serving construction hall 3 on [] These subassemblies have been observed on the rail line in front of the fabrication buildings at the south end of the launch basin, at various points in the staging area, and on the rail spur serving construction hall 3.

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19. (TSR) On [] a possible SSBN missile bay internal-deck-level subassembly was on the rail spur leading into construction hall 3. The subassembly remained in the same relative location on [] and was not observed on imagery of []

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20. (TSR) The conversion of the G-I SSB appeared to be externally complete in May 1978 when it was removed from the floating drydock that it had occupied since late 1976. Modification included the removal of the entire sail and missile tubes and the installation of a shortened sail which included a single missile tube with a diameter of [redacted]. The top of the sail is irregular in shape and contains a missile tube door, [redacted]. This submarine was given the NPIC interim designator 402S. It departed the Severodvinsk complex for sea trials in late July 1978. On [redacted] a personnel hoist, [redacted] in diameter, was positioned above the single missile tube. The submarine was transferred to Balaklava (via the inland waterway) where it has probably been engaged in SLBM popup testing underway since that time. The timing of the conversion of this submarine and the dimensions of the single missile tube indicate that the vessel will probably be used as the at-sea test launch platform for the new SLBM under development for the Typhoon SSBN. This submarine has been designated the G-V SSB.

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21. (TSR) A possible missile tube-related subassembly was identified on a railcar in the eastern fabrication area of the shipyard on [redacted]. The subassembly was [redacted] and contained four dome-shaped end caps which were [redacted] in diameter and [redacted] center-to-center. The intended use of this subassembly is unknown.

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22. (TSR) An unidentified component was observed in the hull section staging area behind construction hall 1 on [REDACTED]. The component was [REDACTED] long with a beam of [REDACTED] and was initially identified as a possible bow component. Although this component is not now believed to be related to the bow area of a submarine, its position in the staging area probably indicates that it is submarine related.

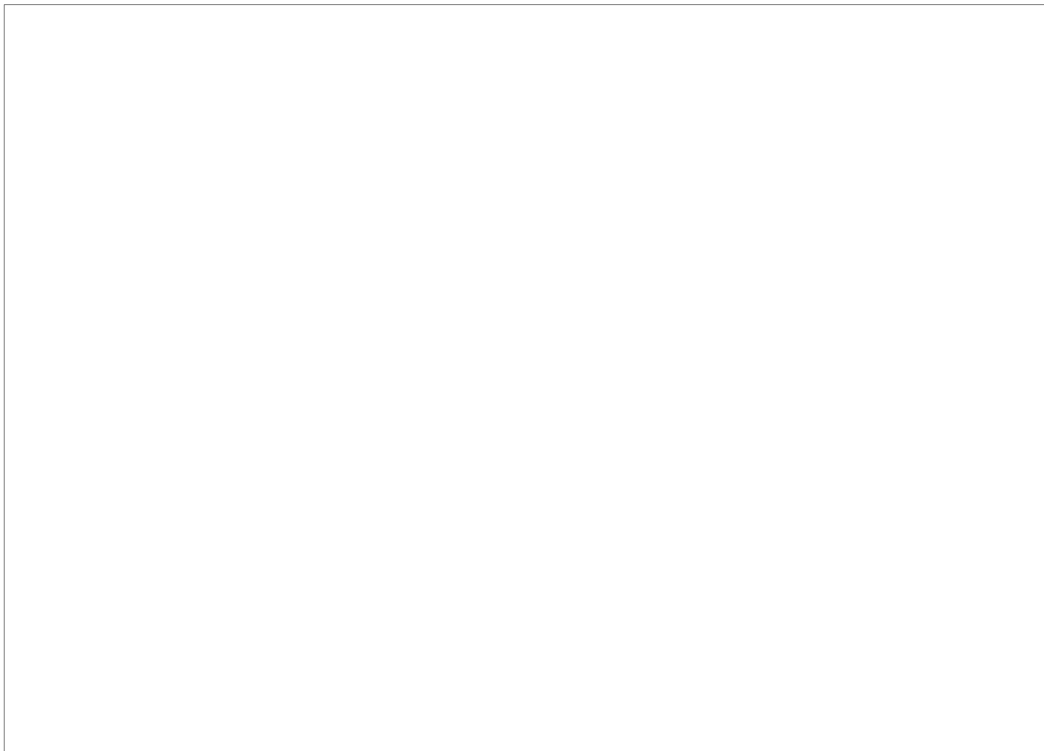
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23. (TSR) On [REDACTED] an unidentified pressure hull section was observed under staging shed B. This section, unlike those generally seen at Severodvinsk, appeared to be one section within another section and had an outer diameter of approximately [REDACTED] an inner diameter of approximately [REDACTED] and a length of [REDACTED]. This diameter exceeds the maximum pressure hull diameter for the D-series submarines, and this hull section is believed to be intended for the Typhoon SSBN.

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24. (TSR) Between [] a pressure hull section [] in diameter and [] meters long was under staging shed B. This diameter exceeds the maximum pressure hull diameter for the D-series submarines, and this hull section is also believed to be intended for the Typhoon SSBN.

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25. (TSR) The aft section of a probable new-type submarine sail was observed on a railcar near the southwest corner of the launch basin throughout the first half of 1979. Although the dimensions of the component were compatible with the aft end of a Y/D-class SSBN sail, the sloping trailing edge differs from the vertical trailing edge of the D-III SSBN sail currently under construction in hall 1. The appearance of this sail component could be expected during this timeframe for a new class of submarine on which construction began in mid-1975.

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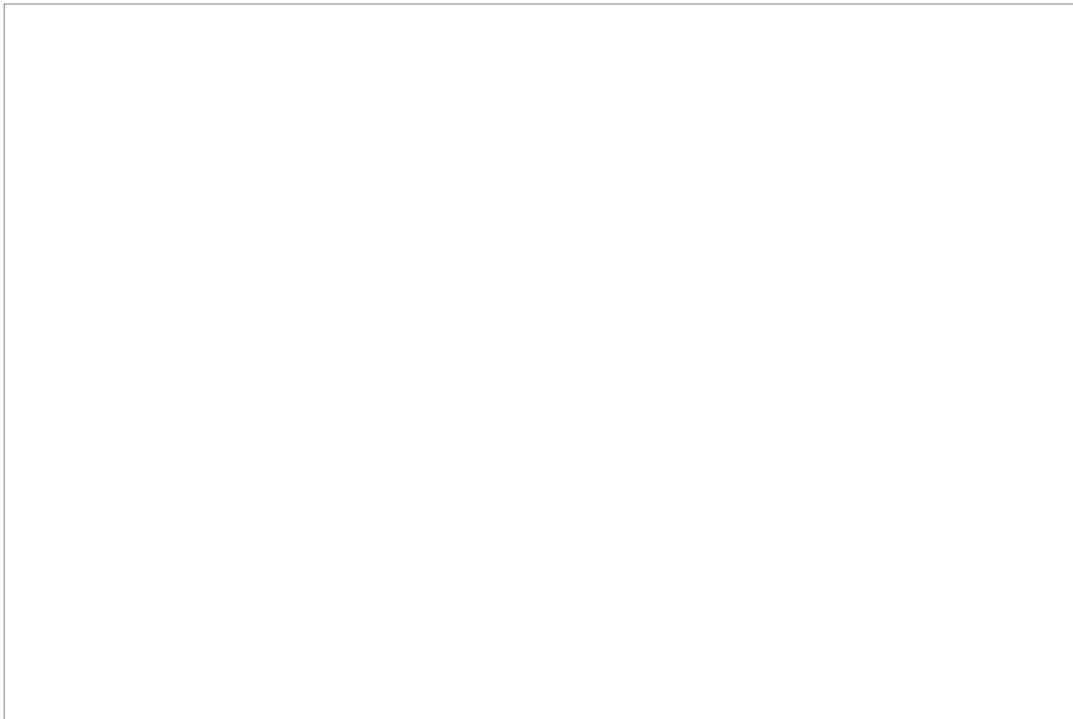
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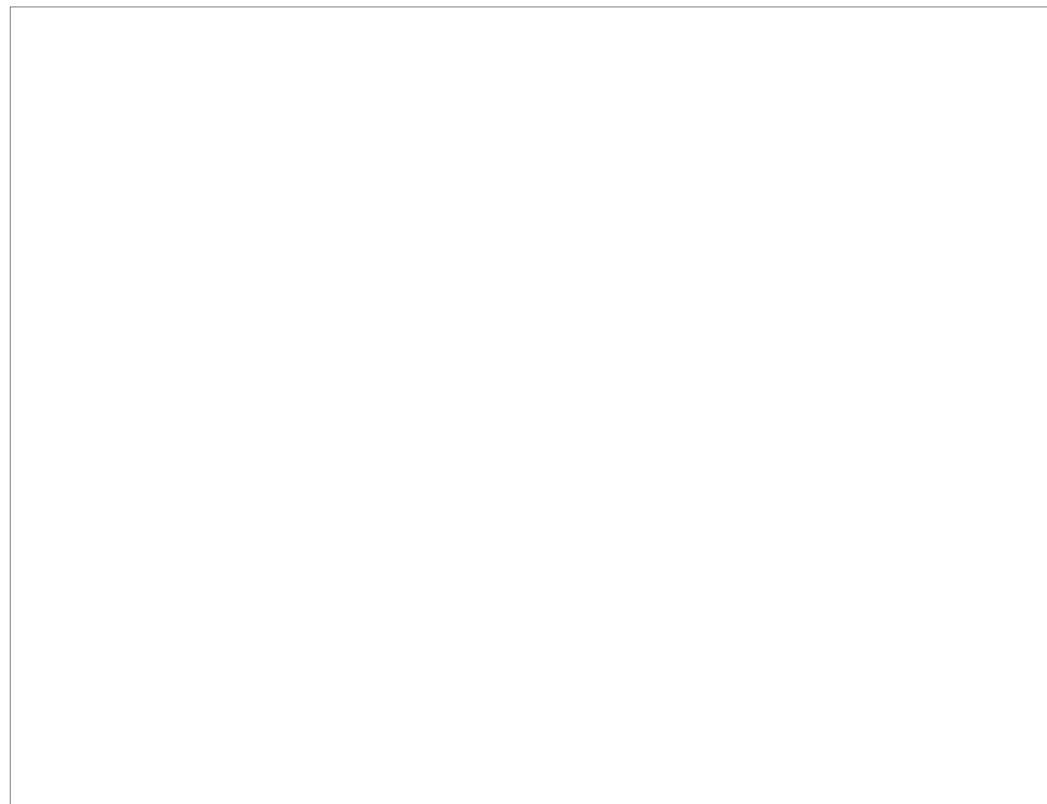
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26. (TSR) On [] two possible personnel hoists/missile tube work platforms were observed (one shown below). The hoists were [] long and [] in diameter. These components will probably be used for work inside the completed missile tubes and indicated that the completely assembled missile tubes had probably been installed in the submarine by early 1979.

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27. (TSR) Unidentified objects which could equate to missile tube doors have continued to be observed outside the fabrication building south of construction hall 1 since March 1979. These components are [] in diameter and [] long, with a [] long straight lip (all measurements []). An additional unidentified component with an outer diameter of [] and an inner diameter of [] was nearby on []

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28. (TSR) Possible missile tube components with an inner diameter of approximately [] and an outer diameter of approximately [] have been identified throughout most of 1979. These components have been observed throughout the shipyard complex and may or may not be related to missile tube construction; however, their diameter generally equates to the diameter of other missile tube-related components believed to be for the Typhoon SSBN.

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29. (TSR) A possible submarine bulkhead with a diameter of [] was observed on a railcar in the pressure hull staging area on []. Although the diameter of this component does not necessarily preclude its use in one of the two D-III SSBNs under construction in hall 1, it is believed that their construction has progressed beyond the point of the insertion of the bulkhead in the hull. Therefore, the conclusion is that this component is intended for the Typhoon SSBN construction program in hall 3 and would be incorporated into hull number 2.

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30. (TSR) On [] two canvas-covered five-bladed screws were observed on a railcar at the main quay. The screws were [] in diameter and appeared to be similar to the [] screws on the D-series SSBNs. Like the sail component mentioned earlier, the appearance of these screws could be expected during this timeframe for a new class of submarine under construction since mid-1975.

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31. (TSR) The erection of a rigid framework structure over the staging platforms between construction hall 3 and fabrication building 2 is related to the SSBN construction in hall 3. The framework over the staging platforms was first observed on [] the framework for a similar, flat-roofed structure over the northernmost loading rails into construction hall 3 was being erected. These structures will serve the same purpose as the staging sheds behind construction hall 1, and when roof panels are in place, the area of the transverser carriage will be the only area for the unimpeded observation of new pressure hull sections behind hall 3. Also depicted are the wheeled hull section transporter and crates which are associated with the Leningrad Heavy Equipment Plant Kirov 185 ([])

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32. (TSR) On [] an unidentified component was observed on a staging platform under the lattice framework between construction hall 3 and fabrication building 2. This represents the initial use of the staging platforms, and on [] this component was identified as a possible hull section. However, the component could not be confirmed as a submarine hull section until [] and []. The hull section was [] in diameter and [] long. While mensuration accuracy (plus []) does not preclude the possibility that this hull section may be intended for a D-series SSBN hull, its length and the location between construction hall 3 and fabrication building 2 suggest that it is probably intended for the Typhoon SSBN under construction in hall 3. In addition to the [] hull section, two possible hull section covers were over the staging platforms on []. One cover was octagonal in shape with a width of [] and was [] above the rails of the staging platforms. The size of this cover and its height above the staging platforms suggest that it may be used to cover a pressure hull section similar to the [] by [] pressure hull section seen on the wheeled hull-section transporter adjacent to construction hall 2 in October 1977. The second cover was [] meters long and was over the staging platform at the south end of the staging area. This cover was [] meters above the rails of the staging platforms.

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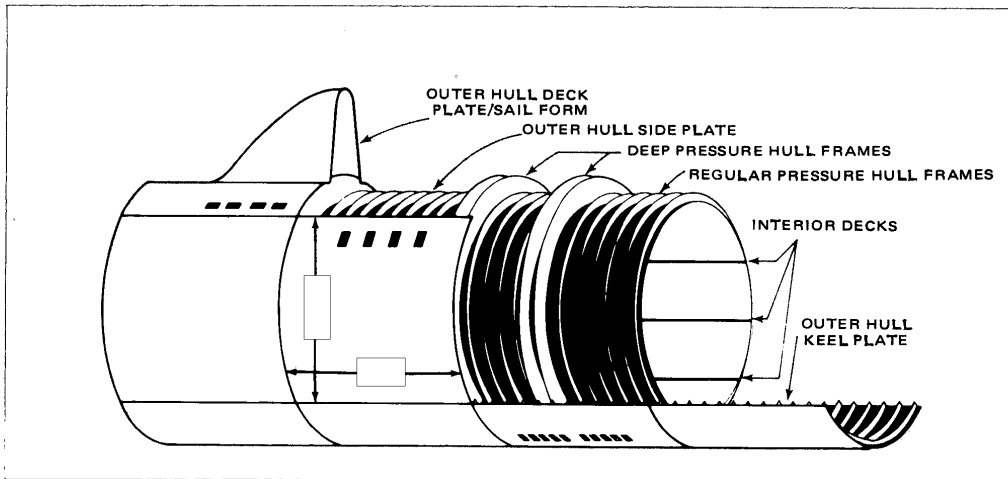
33. (TSR) From [] a section of outer hull plating with a [] chord was observed on a railcar southwest of the launch basin. The plate had a length of []. Assuming that this plate is a quarter section of the outer hull (inset),² the submarine for which it is intended would have a projected diameter of [] if it were completely circular. The plate was positioned on top of a second plate on a railcar; however, mensuration of the bottom plate was not possible. Both of these plates are probably intended for the Typhoon SSBN believed to be under construction in hall 3; this is the first evidence as to the outside diameter of the submarine. However, prior to the identification of these plates, the outer diameter of the submarine had been estimated to be []. This estimate was based on the diameter of the boxed hull sections seen during 1975.

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34. (TSR) On [] two unidentified crates were observed on the loading rails behind construction hall 3 (Figure 32A). The crates were [] and was similar in size and configuration to a crate observed at Leningrad Heavy Equipment Plant Kirov 185 in August 1978 (Figure 32B). The crates were probably transported to Severodvinsk in the Stern Horn transporter dock—ARD(T)—which has been associated with the component transfer platform at the east quay and with a similar platform at the Leningrad Plant. The two crates remained in the staging platform area at Severodvinsk through []. Only one crate was observed on [] and the second crate had apparently been moved inside one of the transverser-associated buildings. By [] (Figure 32C), one crate had been loaded into the well of the ARD(T). By [] both crates had been loaded into the well and by [] the ARD(T) had departed the Severodvinsk complex. A collateral report indicated that the Stern Horn ARD(T) was berthed at the Leningrad plant on [].

Although much speculation exists concerning the Leningrad connection between these crates and the unique ARD(T), the construction of the dock and transfer facilities at Severodvinsk and at Leningrad is almost surely related to the construction program ongoing inside construction hall 3. However, the transfer of components from the ARD(T) to construction hall 1 can be accomplished by movement of the transverser carriages through fabrication building 1.

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35. (TSR) Between [] a large floating drydock (that will be used for the launching of units from construction hall 3) was rolled out of construction hall 1 on launch rails A and B. The dock is 195 meters long with an exterior width of 44 meters. The side walls overhang one end of the dock by 15 meters and the opposite end by 8 meters. The floor of the dock is 172 by 32 meters. Stabilizing pins on the bottom of the sidewall overhang arms of the launch dock will probably rest on the launch dock support cradles in the track of the basin ledges in front of construction hall 3.

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36. (TSR) Since January 1979, a large traveling crane has been under construction on the newly reinforced quay at Severodvinsk Naval Base West [REDACTED]. The crane base and vertical structures are similar to the missile loading crane at Sayda Guba Submarine Base [REDACTED]. The sliding arm support structures are [REDACTED] and are [REDACTED] above the quay. The over-the-water reach of the sliding arm support is [REDACTED]. The intended use of this crane is unknown; however, it is not believed that a crane of this size is necessary to fulfill the SSGN loading requirements of Naval Base West. Erection of the crane, quay construction, and the construction of additional arch-roofed storage facilities at Naval Base West is continuing.

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37. (TSR) Erection of two large portal jib cranes has been ongoing on the reinforced portion of the new quay since December 1978. Quay construction, earth removal, and dredging of the area continued throughout 1979. This area will probably become the fitting-out area for units constructed in hall 3.

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38. (TSR) By late September 1979, the major construction program in the expanded launch basin, which began in the spring of 1973, and facilities for the launching of newly constructed units from construction hall 3 were completed. Construction of the four pillar-supported platforms outside the launch basin, alignment of the launch rails, and the installation of the transversing launch dock support cradles on the basin ledges in front of construction hall 3 was nearly complete. On [] a probable load-bearing stress test was being conducted on the northernmost set of rails, suggesting that the launch rails would soon be operational.

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39. (TSR) The conceptual drawing of the Typhoon SSBN was derived by projecting the basic D-I SSBN hull sections to the scale of the boxed hull sections observed at construction hall 2 in 1975. Based on the assumption that the Typhoon will carry between 16 and 24 missiles and that the three boxed hull sections seen in 1975 were intended for the missile bay, two hypothetical submarines were conjectured. Using a direct relationship between the D-series pressure hull and the maximum beam on the submarine, the beam of the Typhoon SSBN is estimated to be [REDACTED]. The use of six [REDACTED] boxed hull sections for the missile bay area of the Typhoon results in a submarine with an approximate overall length of 170 meters and equipped with 16 missiles larger than the SS-N-5/SS-N-18. The use of nine [REDACTED] long boxed hull sections results in a submarine with an approximate overall length of 186 meters capable of carrying 24 missiles.

40. (TSR) A new submarine, 170 meters long, would be compatible with the 172-meter-long floor of the launch dock for construction hall 3. However, the launching of a 186-meter submarine that overhangs the floor of the launch dock would probably not present an insurmountable problem at Severodvinsk. This method is currently used at Leningrad Shipyard Admiralty 194 [REDACTED] where the 102-meter-long, V-class, nuclear-powered attack submarine is launched into a launch dock with a floor length of [REDACTED] meters.

41. (TSR) At least four additional hull sections believed related to the Typhoon construction program are depicted on Figure 37. Mensurational accuracy and fragmentary information precludes the accurate placement of these hull sections, and they are positioned arbitrarily for continuity purposes only.

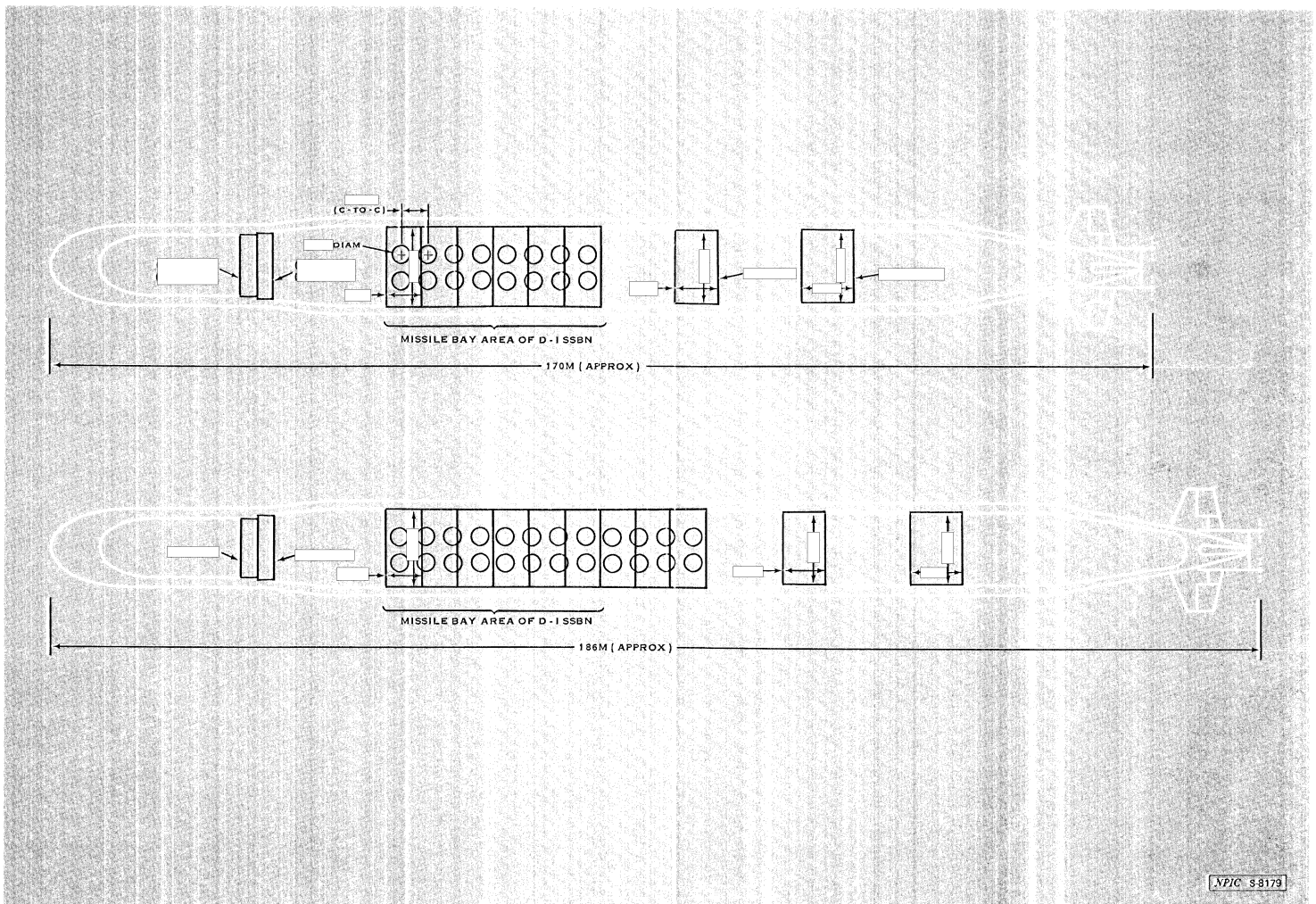
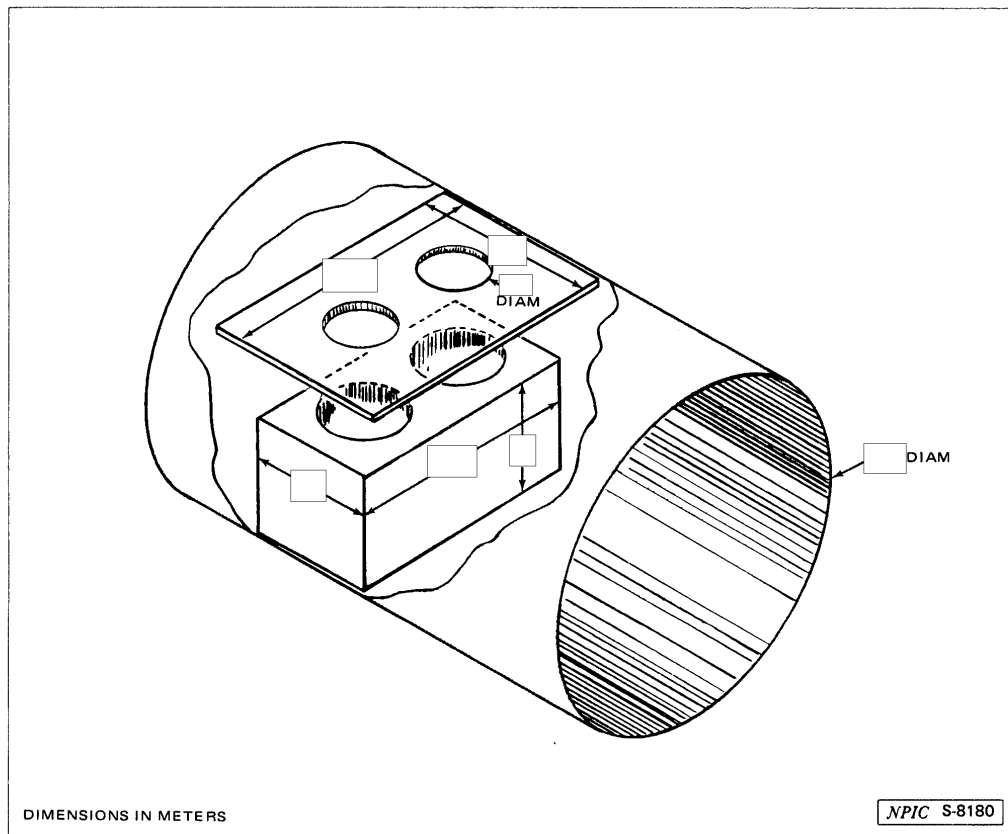


FIGURE 37. CONCEPTUAL DRAWINGS OF THE TYPHOON SSBN

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42. (TSR) A conceptual drawing depicting the possible missile bay internal-deck-level subassembly and two-hole internal missile bay deck plate inside the [] hull section appears below. Speculation as to the arrangement of the subassemblies and the one-, two-, and four-hole plates is unlimited and will not be discussed in this report. Although the subassembly (Figure 19) is believed to be positioned on the fore-and-aft axis underneath the two-hole plate, a depiction of its position and arrangement has not been attempted.

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43. (TSR) Although the size, configuration, and missile load of the Typhoon SSBN will probably not be known until the submarine is actually launched, evidence of its construction since 1975 supports the belief that a) the submarine will be larger than the D-series SSBNs; b) the submarine will be the launch platform for a large, new SLBM currently under development; c) the outer hull components and screws seen during 1979 are probably intended for Typhoon SSBN unit 1 which is estimated to be in the late stage of construction and will probably be launched early in 1980; d) the hull sections, reactor plates, and missile bay components seen in 1979 are intended for unit 2; and e) although the new construction complex was designed with the flexibility to meet changing future construction requirements, it is currently being used for the construction of Typhoon SSBNs.

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- (S) Comments and queries regarding this report are welcome. They may be directed to [] Soviet Strategic Forces Division, Imagery Exploitation Group, NPIC, [] 25X1
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